Ministry of Health

National Malaria Control Centre

2011 MALARIA ANNUAL REPORT

Zambia Integrated Systems Strengthening Program
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The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

Abbreviations/Acronyms

AID	Active Infection Detection
BCC	Behavioral Change Communication
CHA	Community Health Assistant
CHC	Community Health Coordinator
CHV	Community Health Volunteer
CHW	Community Health Worker
EHT	Environmental Health Technicians
FANC	Focused Antenatal Care
GIS	Geographical Information System
GPS	Global Positioning System
HMIS	Health Management Information System
ICCM	Integrated Community Case Management
IPT	Intermittent Preventive Therapy
IRMTWG	Insecticide Resistance Management Technical Working Group
IRS	Indoor Residual Spraying
LLIN	Long Lasting Insecticidal Net
MIS	Malaria Indicator Survey
MOH	Ministry of Health
NMCC	National Malaria Control Centre
PDA	Personal Digital Assistant
PHO	Provincial Health Office
PMI	President's Malaria Initiative
PPE	Personal Protective Equipment
USAID	United States Agency for International Development
ZEMA	Zambia Environmental Management Agency
ZISSP	Zambia Integrated Systems Strengthening Program

Table of Contents

Page

1 Introduction

This report covers the activities carried out by the malaria team from January 1st to December 31, 2011. It outlines the key achievements and the challenges experienced during the period under review.

2 Indoor Residual Spraying Needs Assessment

ZISSP provided technical and financial support to undertake a needs assessment in all 72 districts of the country. The purpose was to systematically gather information that would assist the National Malaria Control Program and the indoor residual spraying (IRS) implementing districts to determine their requirements for implementing IRS activities. The data from the assessments were used to forecast requirements for insecticides, personal protective equipment, and other logistical needs.

3 Training in Indoor Residual Spraying

ZISSP trained 105 district-level trainers in IRS techniques, implementation, and supervision. Developing a cadre of trainers for IRS is one of the most important activities of the malaria control program. The aim is to build capacity at national level to ensure that all districts follow national standards.

The trained trainers are responsible for training spray operators before the spray operations commence and also provide technical support supervision to the districts to ensure that the spraying of household structures is conducted in accordance with the IRS guidelines. In the third quarter of 2011, ZISSP provided financial and technical support to 35 districts to train1, 783 spray operators.

The National Malaria Control Center (NMCC) refers to this process as cascade training because the district-level trainers transfer the skills to their local spray operators.

Master Trainer, Francis Matoka, demonstrates how to pressure the pumps during the IRS training of trainer's workshop in June 2011

4 Supervision of Indoor Residual Spraying Activities

During the 2011 IRS spray season, ZISSP worked with the NMCC and the PHOs to supervise and monitor IRS activities in all 72 districts to ensure that the spraying of household structures was conducted in line with the IRS guidelines. At the end of quarter four, two monitoring supervision exercises were undertaken. The major challenge during the 2011 spray season was inadequate funding from MOH for the IRS program. This contributed to late commencement of IRS activities. Some districts started their IRS activities as late as December.

5 Distribution of IRS Insecticide and Personal Protective Equipment

ZISSP has the mandate to distribute IRS commodities including insecticides procured by the US Government's President's Malaria Initiative (PMI) which was done through RTI International in 2011. ZISSP supported NMCC in distributing insecticides and personal protective equipment (PPE) to the 35 ZISSP supported districts to ensure that the chemicals reached the districts before the onset of the rains. All the chemicals received at central level were stored at Medical Stores Limited (MSL) before being distributed to the 35 districts.

6 Incineration of Insecticide Waste

ZISSP worked with NMCC to collect and export the DDT waste from the 15 DDT districts for destruction by an approved facility in South Africa. The NMCC obtained a certificate of destruction for all DDT waste. ZISSP led a team of experts including Zambia Environmental Management Agency (ZEMA) and IRS managers to collect the pyrethroid waste (sachets, boxes, and drums) from 54 districts and incinerate them in approved incinerators.

7 Geocoding Training and Enumerations

ZISSP trained 20 supervisors and 96 enumerators from five districts to geo-code household enumeration data using personal digital assistants (PDA.) Five districts (Mpulungu, Samfya, Chibombo, Chiengi and Mwense) subsequently completed the geo-coding process and ZISSP supported these districts and NMCC to mine the data from the PDAs and developed a report that was shared with USAID. Strengthening of the National Malaria Control Program by using geographical information system (GIS) mapping tools enables the NMCC to better plan, manage, and report on interventions such as IRS.

8 Entomology Investigation for Insecticide Resistance

In the first quarter of 2011, ZISSP provided technical and financial support for entomological insecticide resistance monitoring in Copperbelt and Eastern Provinces. Results of the resistance monitoring revealed that DDT resistance is widespread in Copperbelt and emerging in Eastern Province. The NMCC presented these findings at a stakeholders' meeting to provide strategic direction which included recommending alternative insecticides in these areas.

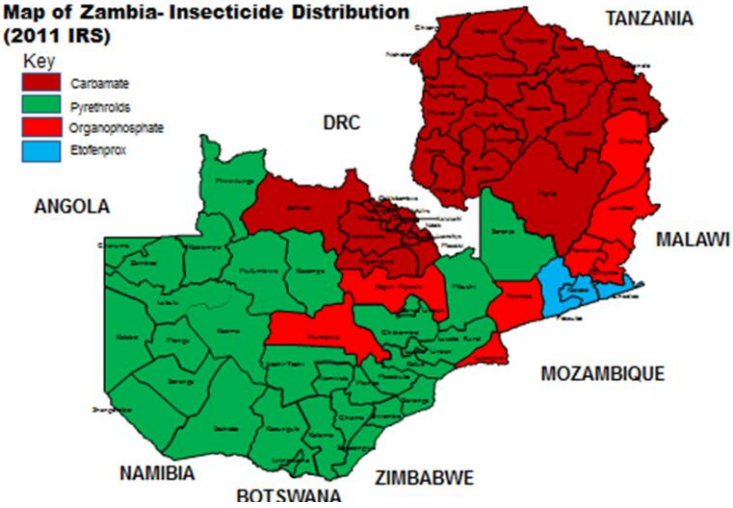
In the second quarter, ZISSP conducted the second phase of the entomological investigations for carbamates in the districts of Copperbelt, North-Western, and Eastern Provinces. The resistance data from the selected

Mulenga Musapa, the ZISSP Entomologist, shows some mosquitoes which were caught in Chipulukusu Suburb in Ndola

districts showed that anopheles gambiae is resistant to DDT and most of the pyrethroids (Permethrin, Deltamethrin and Lambdacyhalothrin) are susceptible to carbamates and organophosphates.

Anopheles funestus was found to be resistant to the same pyrethroids as anopheles gambiae, while it is susceptible to carbamates and organophosphates. Anopheles funestus was also found to be susceptible to DDT in Eastern Province. In July 2011, ZISSP supported NMCC to convene a meeting to formalize the establishment of the Insecticide Resistance Management Technical Working Group (IRMTWG) whose main responsibility is to coordinate national insecticide resistance management. The IRMTWG held its first insecticide resistance discussion and pesticide selection meeting on July 14, 2011. The members reviewed the insecticide deployment criteria for the 2011 IRS season and developed a map showing the insecticides selected for each district based on the data available on insecticide resistance of malaria vectors.

Map of Zambia showing the proposed distribution of insecticides for the 2011 IRS season



9 Creation of Six Sentinel Sites for Entomological Investigation

The IRMTWG agreed that in order for the malaria control program to effectively monitor and manage insecticide resistance, the NMCC should develop a spatio-temporal entomological profile that identifies areas with insecticide resistance and the underlying resistance factors. To do this, ZISSP and NMCC identified six sentinel sites (Kasama, Katete, Kasempa, Kaoma, Kitwe and Luangwa) and started to collect indoor resting vector mosquitoes from these sites and transport them to the central laboratory at the NMCC where they lay eggs. The NMCC team sends the eggs to the University of Liverpool for microarray studies. The microarray data will allow comparison of the genetic structures and gene flow of vector mosquitoes from different selected sentinel sites. These data will establish a baseline for insecticide resistance trends and will support the 2012 plan for insecticide resistance management.

10 Training in Entomological Monitoring

Following the evidence of resistance to the two common insecticides used in the country, there is a greater need to intensify resistance monitoring in all areas where IRS is being implemented. To achieve this, ZISSP trained 54 Environmental Health Technicians (EHT) and IRS coordinators from the 35 districts in entomological monitoring field techniques. Of the 54 trained EHTs and IRS coordinators, 16 were female and 38 were male. EHTs received back packers, aspirators and bioassay bottles and supplies to enable them to function effectively and report data to NMCC that is required for effective decision making.

11 Maintenance of the National Entomology Laboratory and Insectary

In 2011, ZISSP provided substantial technical and logistical support to maintain a breeding mosquito colony at the NMCC for entomological monitoring, including paying monthly wages for two insectary technicians and procuring daily provisions such as washing detergents and sugar. The purpose of the insectary is to provide a source of mosquitoes of known genetic traits and use these mosquitoes in monitoring the quality of spraying, the efficacy of insecticides on walls, and vector resistance.

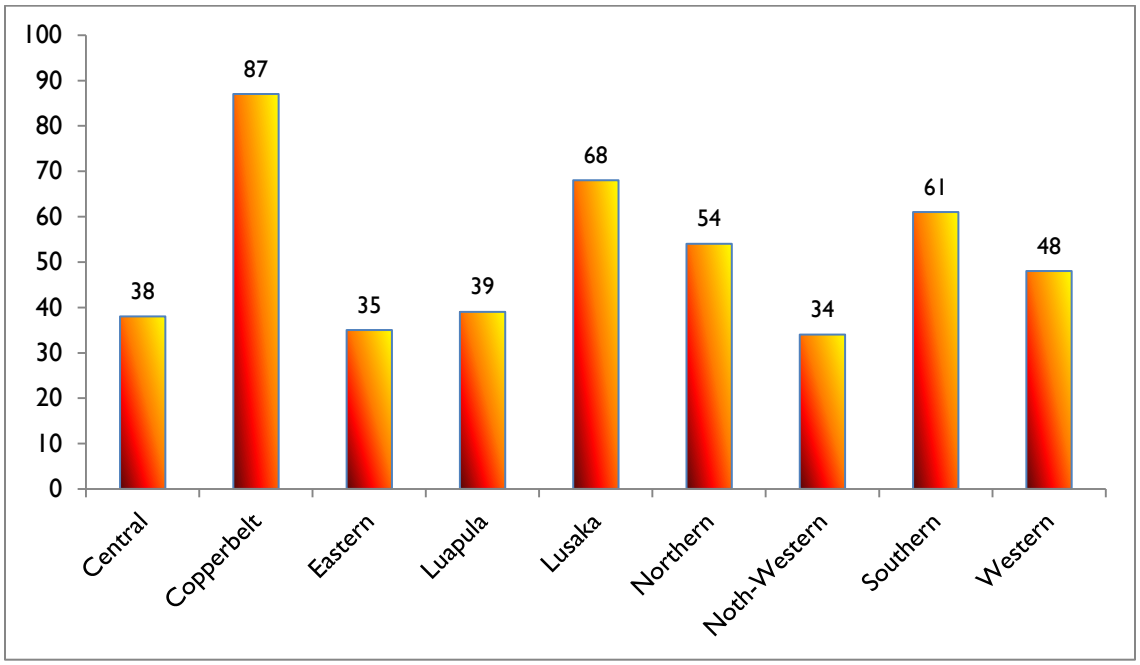
12 Training of Health Workers in Revised Malaria Guidelines

ZISSP in collaboration with NMCC trained 464 health workers using the revised malaria guidelines between January and December 2011. NMCC revised the guidelines for diagnosis and treatment of malaria in Zambia to reflect the updated policy recommendations. These new guidelines are an important reference for general malaria case management. To assist with the training, ZISSP supported NMCC to develop training materials and printed 4,000 copies of the malaria guidelines. These trained health workers will mentor other health workers in their health facilities in correct malaria case management.

A total of 464 health workers consisting of members from the district CCTs, tutors from training institutions and senior clinical officers from district hospitals were oriented to the revised guidelines. Emphasis was placed on proper malaria case diagnosis based on clinical findings and confirming using rapid diagnostic tests (RDTs).

Figure 1 shows the number of health workers trained per province.

Figure 1: Number of Health Workers Trained in Malaria Case Management by Province



13 Malaria in Pregnancy Assessment

According to the malaria indicator survey (MIS 2010), intermittent preventive therapy in pregnancy (IPTp) remains a challenge in some parts of Zambia. In 2011, the MOH received support from ZISSP to conduct a rapid assessment survey on malaria in pregnancy in 18 districts of the nine provinces in Zambia. The results revealed that only 41% of health workers in the selected districts were oriented to focused antenatal care (FANC) within the last two years prior to the survey. As a result, ZISSP supported MOH to train an additional 38 health workers in FANC in Luapula Province. These trained health workers will mentor other health workers in their health facilities in the latest FANC guidelines.

14 Strengthening Linkages between health Providers and the community

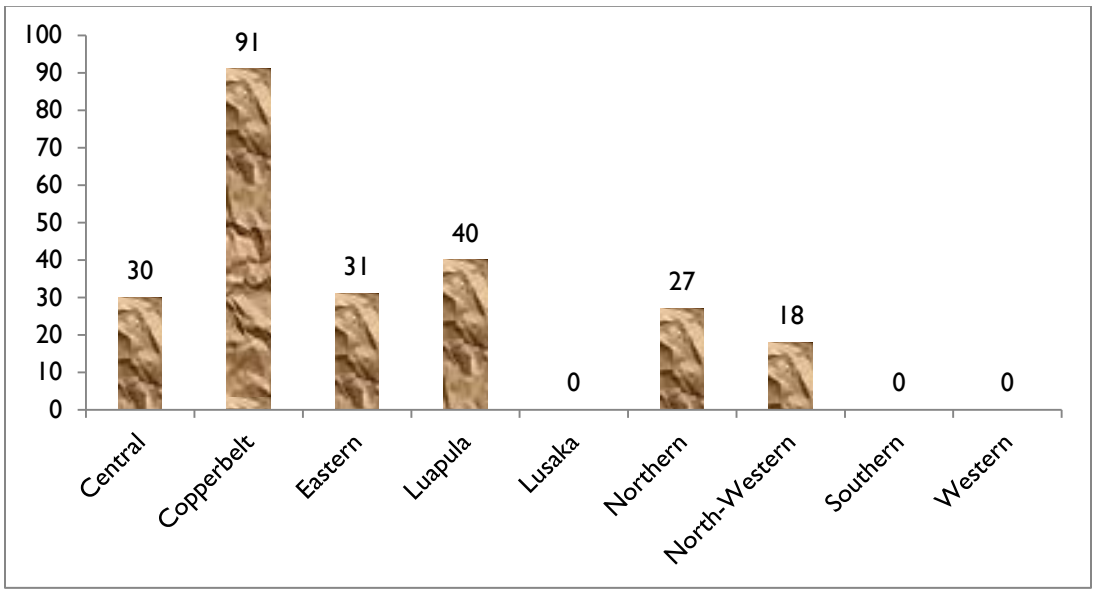
ZISSP collaborated with the NMCC and the Reproductive Health Unit of the MOH to develop the malaria in pregnancy module to be added to the Community Health Assistants (CHAs) curriculum. The module focuses on strengthening pregnancy related behavior communication change (BCC) competencies for CHAs. The HMIS report for the last quarter of 2010 indicated that up to 80% of pregnant women do not have contact with health providers in their first trimester. It is therefore important to build on this and strengthen linkages between health services and communities to continually improve family and community practices that strengthen health seeking behavior in pregnancy.

15 Training of Clinicians in Management of Insecticide Poisoning

ZISSP assisted the NMCC to develop materials to train clinicians in case management of insecticide poisoning. To speed up implementation, ZISSP hired a consultant to lead the activity. The training materials include a PowerPoint presentation, a participant's manual, a flow chart, and questions for evaluating participants. ZISSP used these materials to train 237 clinicians in Northern, Luapula, North-western, Copperbelt, Eastern and Central Provinces in 2011. The training prepared clinicians to respond to toxic reactions to the insecticides.

Figure 2 shows the number of clinicians trained in insecticide poisoning by province.

Figure 2: Number of Clinicians Trained in Insecticide Poisoning by Province



16 Training of Community Health Volunteers in Community Case Management

In Zambia, studies show that up to 80% of deaths in children under- five years of age may occur at home with little or no contact with health providers, emphasizing the importance of strengthening linkages between health services and communities to support and strengthen community capacity to respond to illness. ZISSP provided financial and technical support to the Child Health Unit of MOH to train 32 trainers, 75 supervisors and 91 Community Health Volunteers (CHVs) in integrated community case management (iCCM) in four target districts (Mkushi, Mwinilunga, Mpika and Mansa).

17 Active Infection Defection

In line with the MOH malaria elimination goal, ZISSP together with the NMCC, PMI, Akros Research and the Lusaka DHO team began enhancing surveillance involving malaria active infection detection (AID) pilot program in Lusaka District. Through AID, patients receiving positive confirmation of malaria at local clinic were followed up through community response

whereby community health workers (CHWs) visit the household of the patient and use RDTs to test all family members and neighbors for malaria parasites. In 2011, 600 households were visited and over 1,900 people were tested for malaria. Thirty-three community members were found positive for malaria using RDTs, and 14 of these cases reported neither history of malaria (potential false positive) nor travel outside of Lusaka.

18 Indoor Residual Spray Tool

Zambia has invested heavily in IRS over the past decade and now boasts coverage levels in excess of 35% in urban/peri-urban settings contributing to a significant reduction in the national malaria parasitemia from 22% in 2006 to 16% in 2010 (MIS 2010). Historically, IRS field operators recorded each sprayed house, along with a few limited data elements as a single line item on a paper form. Supervisors would then manually aggregate the data before entering these into a spreadsheet for reporting. Each individual spreadsheet would then be methodically cut-and-pasted into a master spreadsheet document. This slow, labor intensive and error-prone system was only able to collect a limited set of data. To address this issue, ZISSP in collaboration with the NMCC developed an electronic data capture solution and piloted for rapid collection and dissemination of IRS data. IRS operators are individually equipped with a PDA that guides them through collecting necessary data elements including global positioning system (GPS) coordinates for every structure, spray application details, long-lasting insecticidal net (LLIN) usage and previous spray history. Validation rules built into the software ensure that only valid data are entered. Supervisors can review these data at the end of each day, ensuring that data are accurate. Datasets are periodically exported for timely reporting to the district and national levels and allow rapid identification of areas of low spray coverage requiring additional IRS mop-up operations. This robust and expanded data collection method allows fine spatial mapping of spray activities to ensure that IRS applications are as effective and efficient as possible.

The PDA system was designed and deployed in Chibombo district for the 2011spray season. Over 40 spray operators and four Environmental Health Technicians (EHTs) were trained in using the system. Final results will be obtained at the end of the 2011 spray season and will be shared with USAID and MOH for policy change.

19 Entomological Surveillance System

Despite the intensification of vector control programming, entomological surveillance is conducted sporadically in a centralized manner by the NMCC or by partner organizations. This is geographically limited in its coverage and data are intermittently collected. Currently, there is no routine longitudinal surveillance system that monitors the impact of expensive vector control interventions from an entomological perspective.

A conceptual framework based on a phased delivery of individual components of an integrated entomological surveillance system has been designed, along with appropriate supporting tools for districts with on-going vector control activities. Individual components of the overall program include training of new and existing recruits, data management, both intra- and inter-district program performance, and calculation of entomological parameters associated with local malaria transmission. Decentralized program delivery and field level management through

the EHTs who are responsible for the management of district based vector control activities. Fifty four (54) EHTs from 18 districts were recruited and have embarked on the training phase of the program. Overall, there was a 33% increase in knowledge amongst EHT training recruits ($P<0.001$). Despite this cadre having no specific background in medical entomology, their management of district-based vector control activities and baseline training outcomes indicate that they are well suited to pilot the integrated entomological surveillance model in 2012. Routine collection of entomological surveillance data will provide an evidence base in which program sustainability together with optimizing the use of district based human resources.

20 2.0 Challenges and Solutions

The following are some of the challenges that were encountered and how they were addressed:

No.	Challenges	Solutions
1.	Delay by the World Bank to release operational funds for the 2011 IRS campaign. This led to late initiation of IRS campaign by districts including the ZISSP IRS districts.	ZISSP proposed to PMI to enable the organization fund operational costs of IRS in the 2012 spray season using the same budget. The proposal has been accepted and districts have been selected but awaiting approval by MOH.
2.	Delay by MOH to approve the insectary expansion. This led the derailment to start the expansion of the insectary.	MOH advised ZISSP to engage a private architect to design the building. A firm has been identified and design is likely to be approved in the 1st quarter of 2012.

21 Focus for 2012

The following are the key activities planned for by the Malaria Team:

(1) Conduct training in IRS, insecticide poisoning, malaria case management, FANC, iCCM and IRS logistics
(2) Review and develop strategic documents and tools for IRS, FANC, and IPTp
(3) Develop the M&E newsletters
(4) Incinerate insecticide waste and transport IRS commodities
(5) Expand the insectary
(6) Conduct entomological investigations, IRS needs assessment and active case surveillance
(7) Support BCC for malaria
(8) Conduct monitoring and supervision during the 2012 spray season
(9) Conduct enumeration of housing structures in selected districts